

calls this interpretation in question. For example, in *Festuca spadicea* these persistent sheaths are found in the soil, where protection from transpiration is of little importance. A more striking observation was made on *Festuca varia*, a species that grows in winter while the soil about its roots is still frozen. Thinking that there might be absorptive organs beneath the mantles, the author finds that downward-pointing hairs are present in this position in many of these grasses. Mostly from such circumstantial evidence, BROCKMANN-JEROSCH postulates that these hairs are water-absorptive organs. Such an observation needs experimental corroboration, as the author frankly recognizes.—H. C. COWLES.

Soil studies.—E. E. FREE¹³ of the U.S. Bureau of Soils has brought together the essential features of our knowledge of soil physics in admirable form for use by physiologists and ecologists. The material is treated under the following heads: the physical condition of soils, the movements of soil water, soil water and the plant, the physical constants of soils, and soil temperature.

FREE has also published an elaborate paper on soil movement by wind.¹⁴ While this treatise will be of value in the first instance to physiographers, it will also be of great interest to all ecologists who are interested in the vegetation of such wind deposits as sand dunes or loess. Among the topics treated are the mechanics of wind translocation, drifting sand and sand dunes, dust storms and dust falls, atmospheric dust, geologic formations of eolian origin, and volcanic dust as soil material. At the close is a remarkably complete bibliographical index of eolian geology; in the compilation of this index FREE was aided by S. C. STUNTZ.—H. C. COWLES.

Defoliation and wood structure.—In recent years many trees of the European larch in the English Lake District have been repeatedly defoliated by the large larch sawfly. Some of the trees have been studied by HARPER¹⁵ to determine the influence on wood structure. Such defoliation means starvation to a greater or less degree, and starvation affects both the amount of growth and the structure of the wood. In the lower parts of the tree, where the rings ordinarily are narrower than they are above, growth may cease altogether; higher up, where there is more growth, the rings may not completely encircle the tree. Even before this effect is seen, there is a reduction in the wall thickening of the autumn wood. This situation is related to an actual lack in the foods necessary to build up these tissues to the usual amount.—H. C. COWLES.

¹³ FREE, E. E., Studies in soil physics. *Plant World* 14:29-39, 59-66, 110-119, 164-176, 186-190. 1911.

¹⁴ FREE, E. E., The movement of soil material by the wind. U.S. Bureau of Soils, Bull. 68. pp. 272. pls. 5. 1911.

¹⁵ HARPER, A. G., Defoliation: its effects upon the growth and structure of the wood of *Larix*. *Ann. Botany* 27:621-642. pls. 2. figs. 2. 1913.